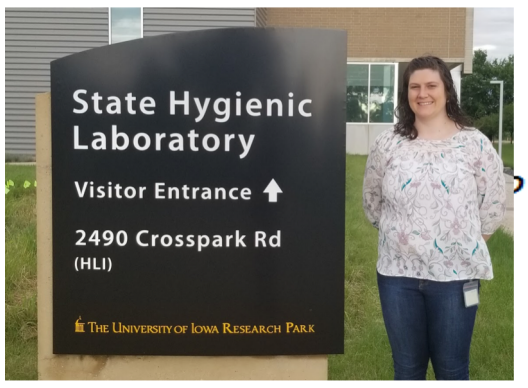
Drawing Conclusions from Data



Kathryn Hafner
Mathematics
Williamsburg Jr/Sr High School
State Hygienic Laboratory

Part I: Overview of Business

The State Hygienic Laboratory in Coralville, IA is responsible for public health concerns in the state, including disease detection, environmental monitoring, and newborn and maternal screening.

Part II: Job Specifics

Part of my job this summer was to do analysis on environmental data sets. I worked primarily with data results of lead detection tests, in the air and in a person's blood, both in-state and across the country.

Part III: Introduce the Problem

How can you make meaning from a large data set? What conclusions can be drawn, and what work do you need to do to make those conclusions possible?

- I was given large sets of data with lead test results and asked to make meaning of the data; are there any conclusions that can be drawn by looking at this set? How can the data be broken down or regrouped in order to make sense of it?

Part IV: Background

- In order to answer this question, students will need to become familiar with Excel, and (even more importantly) learn how to use online resources to answer questions that come up as they work with their data set.
- I also used R and SPSS, but for simplicity's sake, we'll stick to just one program!
- Students will need background knowledge on basic statistics and data displays in order to determine what would be appropriate to calculate/create.

Part V: Business Solution

Some things the State Hygienic Lab did with their data:

- Clean the data, including recoding variables to regroup them (an example: we had the zip code for the location of each specimen; we needed to determine how to divide the state into regions, then convert each zip code to its given region so we could look for trends).
- Create bar charts & histograms for various variables in the data set.
- Create frequency tables, and calculate measures of central tendency and dispersion.
- Draw conclusions about lead levels in regions of Iowa.

Part VI: Student Solutions

- My goal is to find several authentic data sets to meet a range of student interests. Therefore, students will draw different conclusions based on their data set.
- I'll consider this project a success if students learn to utilize different tools in Excel, and if they draw a reasonable conclusion based on their data.
- Choosing data sets with which students will have some background knowledge will be important in making sure they draw reasonable conclusions.